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COWPEA SCAB

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Scab is a disease of cowpeas caused by the fungus *Cladosporium vignae* Gardn. It has been recognized in Florida for a number of years and is statewide in its distribution. The disease has been found in several adjoining states but its exact distribution in the United States has not been determined. Local observations indicate that it is more prevalent and liable to be more destructive in Florida on spring plantings than on summer and fall plantings. No difference in severity of the disease has been observed on robust or poorly growing plants of the same variety; nor has soil type been an important factor.

So far as is known, the disease affects no other crop. Among the numerous commercial varieties of cowpeas a wide range of susceptibility has been observed. The disease is usually severe and results in a partial to complete loss of the more susceptible varieties in some seasons. Losses are widely variable, primarily because of the erratic occurrence of the disease. Some seasons the disease is but mildly important, while during other seasons or in other localities all pods may be affected. This behavior of the disease is probably due to variations in weather conditions.

The fungus produces large numbers of spores on the lesions which appear on the aerial parts of the plant, particularly on the pods. The spores are very small and olive-green in color. When mature they are easily detached by wind, rain or other means and may be spread to adjoining plants or to greater distances.

Primary infection may result from seed which have become infected in the diseased immature pods. The fungus survives from harvest to the following planting time on the seed coat or in the cotyledons. Upon germination the cowpea seedling usually carries the seed coat up into the air on the cotyledons. In the infected seed the fungus develops in the seed coats and cotyledons while they are still attached to the seedling. Provided with favorable moisture, these cotyledon infections produce spores in abundance. These spores are detached and cause infection in adjoining cowpea plants. Primary infection is seldom very conspicuous unless a high percentage of the seed is infected and weather conditions are favorable for the disease to develop.

Lesions on the foliage and young stems are small and inconspicuous except when very numerous. As a consequence secondary infection may develop, unnoticed, before blossoming time.

The spores germinate quickly in free water on the plants, such as dew, and cause infection within 24 to 48 hours. The young tissues are most susceptible. As the plants grow older the peduncles, foliage and pods become less liable to attack. Plant tissues that have escaped infection for two weeks or more will remain free from the disease except under extremely favorable conditions.

Symptoms.—Infected seed is known to be one source of primary infection of the seedlings. They are difficult to detect, especially in the colored varieties. In many cases only a small percentage of the seed may be infected. Seed infection produces elongate brownish lesions on the stem and cotyledons and barely visible, dark, circular, water-soaked spots on the foliage of the young plants. The fungus grows rapidly on these spots and because of the abundance of spores produced upon their surfaces they soon appear to be velvety in texture and olive-green in color. With continued favorable weather conditions these spores are distributed and cause additional lesions on the new growth.

More or less elongate lesions appear on the midrib on the lower surface of the blade and on the petioles, fruit peduncles and pods so that there is an abundant supply of spores by the time the plants begin to bloom. No other plant parts are as severely affected as the pods. Pods which become heavily infected when very young usually wither and die before becoming an inch long. When infection is less severe the pod may attain half normal size, becoming very irregular in shape. Fewer infections result in large scattered lesions. The infected pods, diagnostic of the disease, often become very definitely curved or even coiled with large, slightly raised, cracked, brown to tan, scabby, corky, irregular-margined lesions over their surface. Spots on foliage, stems, and peduncles are most often smooth and regular with even margins.

Control.—The first item of control is the planting of disease-free seed. Because of the difficulty in detecting diseased seed this will not be possible until certified seed are put on the market. A definitely planned rotation is also recommended, since it is probable that the scab organism may live over on old vines. A fungicide, either spray or dust, could be applied profitably. It should be applied when the plants are in the seedling stage and discontinued before the plants bloom. A 2-2-50 bordeaux mixture applied at 10-day intervals in sufficient quantities to cover the plants or 20-80 copper-lime dust applied at the rate of 10 to 25 pounds per acre per application, depending on the size of the plants and their spacing, should be beneficial under most conditions.

Trial plantings of commercial seed of 30 varieties of cowpeas, replicated in several sections of the state during the past season, indicated a wide range of variability in the amount of disease occurring on them. All of the highly desirable fresh-vegetable types of early varieties of cowpeas, such as the many selections of Ramshorn, California, Extra Early, and strains of Blackeye, were the most susceptible to the disease. They were usually 50 to 100% infected and consequently produced little or no marketable pods or seed. Early varieties such as Blue Goose, Black Crowder, Purple Hull and Purple Hull Crowder showed none of the disease during the season. The mid-season and late varieties such as Brabham, Clay, Cream Crowder, Iron, Ladyfinger, and Whippoorwill were free from the disease during the season but set a light crop of pods, while Bunch Conch and Cream Lady were usually infected.